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## **2011 MICHIGAN FURBEARER HARVEST SURVEY**

Brian J. Frawley

### **ABSTRACT**

*A sample of furtakers was contacted after the 2011 hunting and trapping seasons to estimate the number of participants, days afield (effort), and furbearer harvests. In 2011, 25,675 people purchased a fur harvester license, which was 6% greater than in 2010. In 2011, about 15,226 license buyers either hunted or trapped furbearers. About 33% of the license buyers trapped (8,597 trappers), 41% hunted (10,450 hunters), and 15% (3,821) both trapped and hunted. Overall trapper and hunter numbers combined increased significantly by 8% between 2010 and 2011. Significantly more trappers pursued raccoon, bobcat, beaver, and otter in 2011 and significantly more hunters pursued raccoon and bobcat, compared to 2010. Changes for hunting and trapping effort and harvest between 2010 and 2011 generally followed changes in the number of furtakers. Hunters most commonly sought coyotes, raccoons, and red fox, while trappers most frequently sought raccoons, muskrats, and coyotes. Trends in harvest can be affected by both changes in furtaker and furbearer numbers; thus, harvest per furtaker was examined for trends. The mean number of raccoon and opossum taken per furtaker has increased since the 1980s. The mean harvest of red fox by both hunters and trappers has declined since the mid-1980s. These trends suggest raccoon and opossum may have been increasing in abundance during the last 20 years, while red fox numbers may have been declining. An estimated 249 trappers caught and released 352 bobcats that were caught in traps set for another species in 2011.*



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## INTRODUCTION

The Natural Resources Commission and the Michigan Department of Natural Resources (DNR) have the authority and responsibility to protect and manage the wildlife resources of the state of Michigan. Harvest surveys are one of the management tools used by the DNR to accomplish this statutory responsibility. Estimating harvests and hunter participation are primary objectives of these surveys. Information from harvest surveys, mandatory registration, and other indices are used to monitor furbearer populations and help establish harvest regulations.

The primary furbearing animals harvested for their pelts in Michigan during recent years have been badger (*Taxidea taxus*), beaver (*Castor canadensis*), bobcat (*Felis rufus*), coyote (*Canis latrans*), fisher (*Martes pennanti*), gray fox (*Urocyon cinereoargenteus*), marten (*Martes americana*), mink (*Mustela vison*), muskrat (*Ondatra zibethica*), opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), red fox (*Vulpes vulpes*), river otter (*Lontra canadensis*), striped skunk (*Mephitis mephitis*), and weasels (*Mustela* spp.) (Frawley 2012a). Opossum, weasels, and skunks could be taken year-round with any hunting or fur harvester license. The remaining furbearers could be harvested in 2011 during late fall through winter by a person possessing a fur harvesters license (included Fur Harvester, Junior Fur Harvester, Senior Fur Harvester, Non-resident Fur Harvester, Military Fur Harvester, Resident Fur [trap only], and Junior Fur [trap only]) (Table 1). Landowners or their designees could take raccoons and coyotes throughout the year on their property without a license if these animals were doing or about to do damage. Coyotes could also be taken by hunters possessing a small game hunting license. Thus, harvest estimates of coyotes, raccoons, opossum, skunks, and weasels from this survey do not represent all possible forms of harvest, but only those taken by people with a fur harvester's license.

## METHODS

Following the 2011 hunting and trapping seasons, a questionnaire was sent to a random sample of people (4,198) who had purchased a fur harvester license (Table 2). All licensees had an equal chance of being included in the random sample. After the sample was selected, licensees were grouped into one of four strata on the basis of their residence. These strata included residents of the Upper Peninsula (UP), Northern Lower Peninsula (NLP), Southern Lower Peninsula (SLP), and nonresidents (Figure 1). People receiving the questionnaire were asked to report whether they pursued furbearers, number of days spent afield, and whether they harvested any furbearing animals.

Estimates were calculated using a stratified random sampling design (Cochran 1977). Using stratification, furtakers were placed into similar groups (strata) based on their county of residence. Residents of the UP, NLP, SLP, and nonresidents and licensees with unknown residency were grouped into separate strata (Figure 1). The overall sample consisted of 590 people from the UP stratum (N= 3,619), 840 people from the NLP stratum (N= 5,294), 2,750 from the SLP stratum (N= 16,588), and 20 people from the nonresident and unknown residency stratum (N=174). Estimates were derived for each group separately. The statewide estimate was then derived by combining group estimates so the influence of each

group matched the proportion its members occurred in the statewide population of furtakers. The primary reason for using a stratified sampling design was to produce more precise estimates. Improved precision means similar estimates should be obtained if this survey was repeated.

Estimates were subject to both sampling and nonsampling error. When a sample rather than the entire population has been surveyed, there is a chance that the sample estimates may differ from the true population values they represent. The difference, or sampling error, varies depending on the particular sample selected, and this variability was measured by the 95% confidence limit (CL). In theory, this CL can be added and subtracted from the estimate to calculate the 95% confidence interval. The confidence interval was a measure of the precision associated with the estimate and implies the true value would be within this interval 95 times out of 100.

Estimates also were affected by nonsampling error. Nonsampling error can occur for many reasons, including the failure to include a segment of the survey population, the inability to obtain data from all units in the sample, the inability or unwillingness of respondents to provide data, mistakes made by respondents, and errors made in the collection or processing of the data. It is very difficult to measure this error. Thus, estimates were not adjusted for nonsampling error. Furthermore, harvest estimates did not include animals taken legally outside the open season (e.g., nuisance animals).

Statistical tests are used routinely to determine the likelihood the differences among estimates are larger than expected by chance alone. The overlap of 95% confidence intervals was used to determine whether estimates differed. Non-overlapping 95% confidence intervals was equivalent to stating the difference between the means was larger than would be expected 995 out of 1,000 times ( $P < 0.005$ ), if the study had been repeated (Payton et al. 2003).

Estimates of events that occur infrequently are difficult to estimate precisely using common sampling designs (Cochran 1977). Relatively few furtakers harvest river otter, bobcat, badger, fisher, and marten; thus, some estimates associated with these species should be viewed cautiously. More precise harvest estimates were probably obtained for these species through tallying registration reports. All furtakers harvesting a river otter, bobcat, fisher, or marten were required to present these animals at a DNR office for registration. Prior to 2003, furtakers were also required to register badger; however, this requirement was eliminated in 2003. In this report, marten harvest was determined only by registration.

During recent years, all licensed furtakers attempting to harvest bobcat, fisher, marten, and otter in Michigan were required to obtain a free harvest tag from the DNR. The list of furtakers obtaining these harvest tags formed a complete list of trappers statewide pursuing these species. Using these lists, the DNR was able to design separate harvest surveys that provided more precise estimates (i.e., narrower confidence intervals) than previous harvest from surveys of all furtakers. Separate surveys were conducted to estimate furtaker participation, harvest, and effort for bobcat (Frawley 2012b), fisher and marten (Frawley 2012c), and otter (Frawley 2012d) seasons during recent years.

Although furtakers that purchased a small game hunting license could harvest coyotes without a fur harvester's license; these license buyers were not included in this survey. Rather, a separate survey was conducted to estimate the harvest of coyotes taken by small game hunting license buyers (e.g., Frawley 2012e).

While the primary objectives of the fur harvester's survey were estimating harvest, number of participants, and trapping and hunting effort, this survey also provided an opportunity to collect information about management issues. Questions were added to the questionnaire to determine whether trappers had used cable restraints (snare) while attempting to capture coyote or fox during 2011 seasons. Trappers also were asked whether they caught any bobcats incidentally in traps set for another species.

Questionnaires were mailed initially in early May 2012. Up to two follow-up questionnaires were sent to non-respondents. Questionnaires were undeliverable to 63 people, primarily because of changes in residence. Questionnaires were returned by 2,609 people, yielding a 63% adjusted response rate.

## **RESULTS AND DISCUSSION**

In 2011, 26,034 fur harvester licenses were purchased by 25,675 people (Figure 2, Table 2). The number of license buyers in 2011 was 6% greater than in 2010. Most license buyers were men (97%), with an average age of 46 years (Figure 3). About 7% of the license buyers (1,751) were younger than 17 years of age.

Compared to 10 years ago, the number of people buying a fur harvesters license in 2011 increased by about 35% (19,082 people purchased a license in 2001). Although the overall number of license buyers increased, there were fewer license buyers for most age classes between 30 and 42 years of age in 2011, compared to 2001 (Figure 4). However, there were increased furtakers among the youngest and oldest age classes in 2011. The increased furtakers in the oldest age classes likely represented the rising share of older people in the population as the baby-boom generation aged and life expectancies have increased.

### Mail Harvest Survey

Overall, approximately 59% of license buyers either hunted or trapped furbearers during 2011 (Table 3). The number of active furtakers increased significantly by 8% from 2010. About 33% of the license buyers trapped and 41% hunted furbearers during 2011. Trappers most often pursued raccoons, muskrat, and coyote (Table 4). Hunters most commonly sought coyotes, raccoon, and red fox. Coyotes and raccoons ranked as the most frequently sought furbearers when trappers and hunters were combined.

Although the estimated trapper numbers were similar during 2010 and 2011 (Table 3), the number of trappers during recent years is well below the record highs of nearly 16,000 in the early 1980s (Figure 5). The peaks in furtaker numbers corresponded closely to periods when pelt values peaked for many species such as muskrat, raccoon, and red fox (Iowa

Department of Natural Resources 2002). The number of trappers during recent years has been comparable to the numbers active during the 1960s, prior to the peak in fur prices. The estimated number of people hunting furbearers was not significantly different between 2010 and 2011 (Table 3). Since 1999, the number of people hunting furbearers has been consistently greater than the number of people trapping (Figure 5).

Collectively, about the same number of people trapped furbearers in 2011 compared to 2010. Moreover, similar numbers of trappers pursued most species, except raccoon, bobcat, beaver, and otter had greater numbers of trappers seeking them in 2011 than 2010 (Table 4). Overall, similar numbers of people hunted furbearers in 2011 than 2010. Changes for hunting and trapping effort and harvest between 2010 and 2011 generally followed changes in the number of furtakers, except among fisher trappers in which harvest and trapping effort declined significantly.

Harvest of red fox, bobcat, and fisher in 2011 were near the low end of their historical ranges (Figures 6-8). In contrast, harvest of coyote and otter were near the high end of their historical ranges. Many factors influence harvest trends such as furtaker numbers, wildlife population size, harvest regulations, habitat conditions, and fur prices; thus, any interpretations of trends should be viewed cautiously. Trends in harvest per furtaker (Figures 9 and 10) were examined because this measure may eliminate some of the effects of changing furtaker and furbearer numbers over time, although many other factors may still complicate interpretations of these trends (Poole and Mowat 2001).

The mean number of raccoon and opossum taken per furtaker has generally increased since the early 1980s (Figures 9 and 10). The mean harvest of red fox by both hunters and trappers has declined since the mid-1980s. These trends suggest raccoon and opossum may have been increasing in abundance during the last 20 years, while red fox numbers may have been declining.

These trends in furbearer numbers are not unique to Michigan. Increasing raccoon numbers have also been reported in Illinois since the 1980s (Gehrt et al. 2002). Furthermore, declining red fox numbers have been reported in portions of the northern Great Plains since the 1980s (Sovada et al. 1995). The decline in red fox numbers in the northern Great Plains during recent years has been attributed largely to competition from increased coyote numbers (Sovada et al. 1995).

The mean harvest of fisher per trapper has declined during the last ten years (Figure 9). Frawley (2012c) reported increasing effort expended by trappers for each fisher registered during the last ten years. Both the declining mean harvest of fisher per trapper and the increasing effort per registered fisher suggest fisher numbers may have declined over the last ten years. Using fisher trapper effort data with harvest at age information, Skalski et al. (2011) demonstrated a 70% decline in fisher abundance in the Upper Peninsula. The seasonal harvest limit for fisher was lowered from three to one fisher in 2011, and this reduction likely contributed to the decline in fisher taken per trapper in 2011 (Frawley 2012c).

The mean number of bobcats taken per trapper declined from 2003 to 2011 (Figure 9). The seasonal harvest limit for bobcats was lowered from three to two bobcats in 2004, and the season length was reduced in 2009 likely contributing to the decline of bobcats taken per trapper since 2003 (Frawley 2012b).

### Registration Data

Compared to 2010, more otter (47% increase) were registered in 2011; however, fewer fisher (-32% decline), marten (-24%), and bobcat (-7%) were registered (Figure 11, Table 5). Registration totals included only animals legally harvested by furtakers during hunting and trapping seasons. Also, registration totals only included animals that were registered and returned to the furtaker.

### Supplemental Questions

An estimated 3,463 coyote trappers caught 9,809 coyotes with foothold traps, while 2,426 fox trappers caught 5,821 fox with foothold traps (Table 6). These trappers also reported 2,694 coyotes and 979 fox escaping from foothold traps. Among trappers using cable restraints, 1,075 trappers caught 2,352 coyotes, and 559 trappers caught 406 fox. In addition, trappers reported 1,116 coyotes and 274 fox escaping from cable restraints.

An estimated 249 trappers caught a bobcat incidentally in traps set for another species (Table 7). These trappers caught 352 incidental bobcats that were released alive from their traps. In addition, 11 incidental bobcats were registered because they could not be released alive. Because incidental bobcats could be captured more than once, the estimate of incidental bobcats caught by trappers probably does not represent unique bobcats.

### Beaver Trapping Activity by Otter Trappers

In order to trap otter, trappers were required to obtain a free otter harvest tag in addition to a fur harvesters license. A separate survey was sent to these trappers obtaining an otter harvest tag to estimate their trapping activity (Frawley 2012d). Because otter trappers frequently sought beaver, these trappers also were asked to report information about their beaver trapping activity. However, these estimates associated with beaver trapping only represent the participation, effort, or harvest of trappers that obtained an otter harvest tag. In order to put these estimates into a broader perspective, it is important to know what proportion of beaver trapping activity was attributed to trappers having an otter harvest tag.

An estimated 2,812 furtakers sought beavers (Tables 4 and 8). About 48% of these trappers possessed an otter harvest tag (Table 8), and they were responsible for 63% of the beaver taken.

## **ACKNOWLEDGEMENTS**

I thank all the furtakers that provided information. Theresa Riebow completed data entry. Marshall Strong prepared Figure 1. Dwayne Etter, Russ Mason and Doug Reeves reviewed a draft version of this report.

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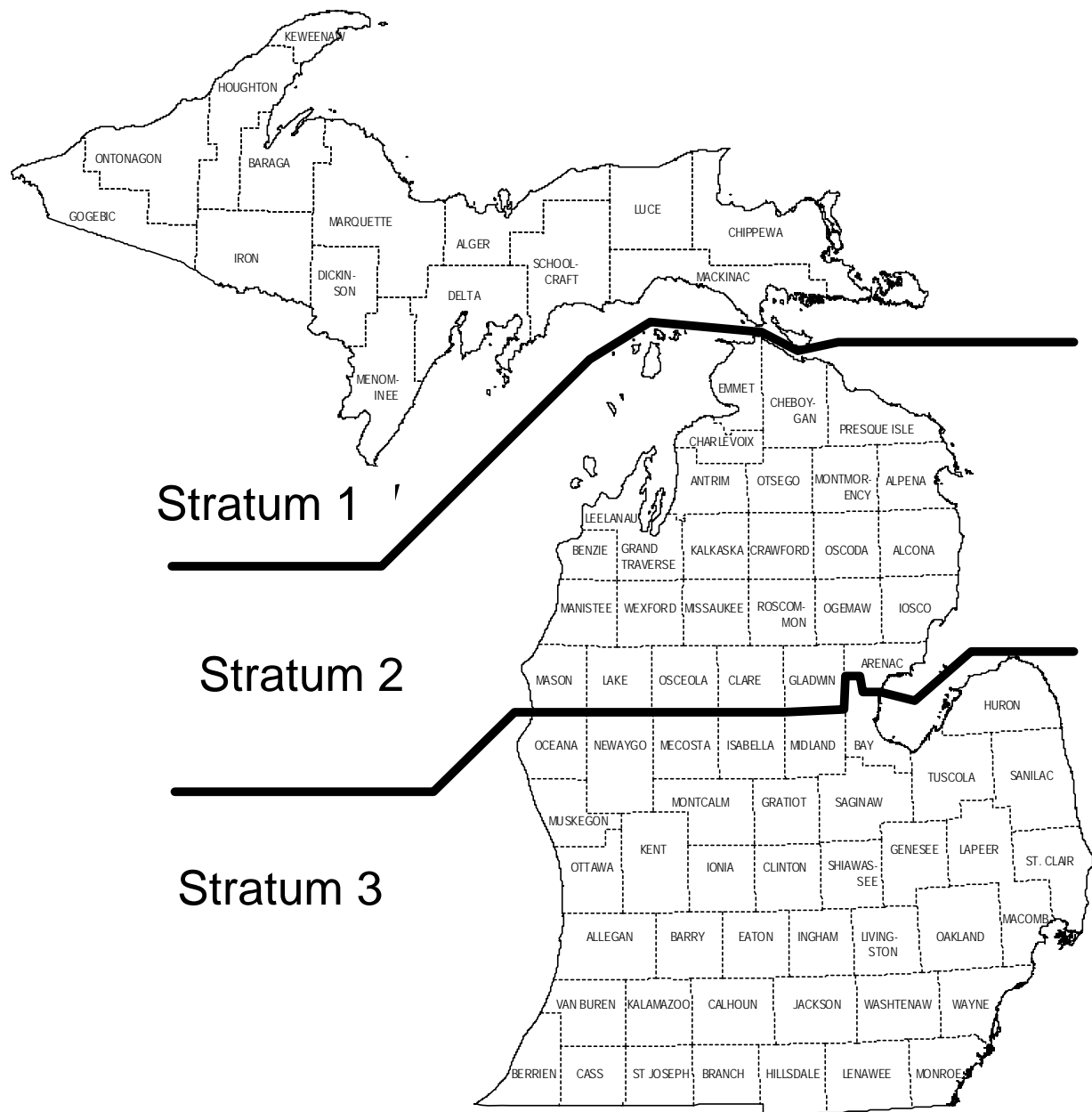


Figure 1. Stratum boundaries used for the analysis of the Michigan furbearer harvest survey. Nonresidents were included as a fourth stratum.



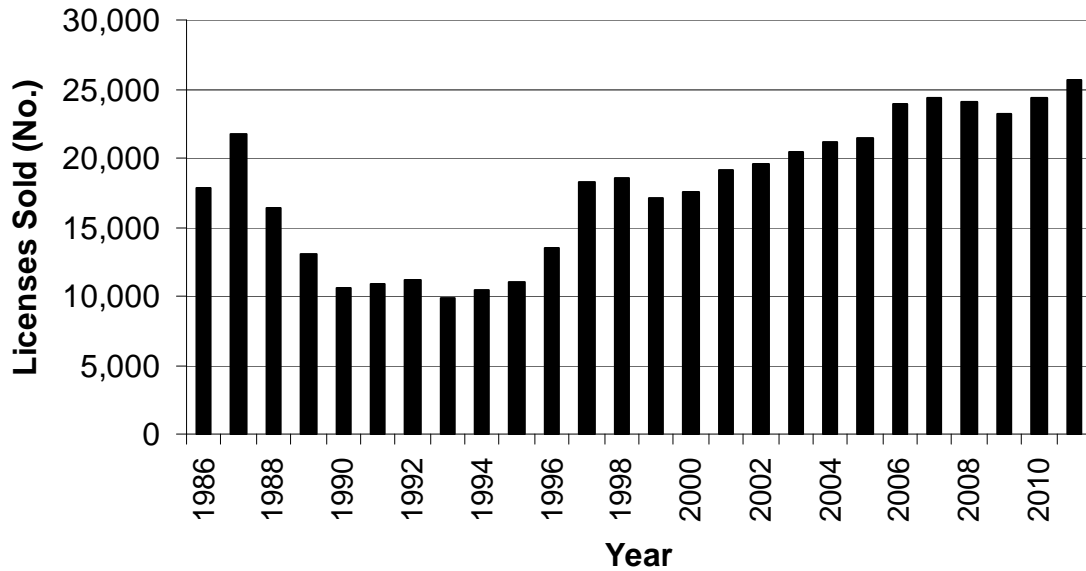


Figure 2. Number of fur harvester licenses sold in Michigan, 1986-2011. Fur harvester licenses included Resident Fur Harvester, Senior Fur Harvester, Junior Fur Harvester, Military Fur Harvester, and Nonresident Fur Harvester licenses. During 1996-2011, totals also included Resident Fur Harvester (trap only) and Junior Fur Harvester (trap only) licenses.

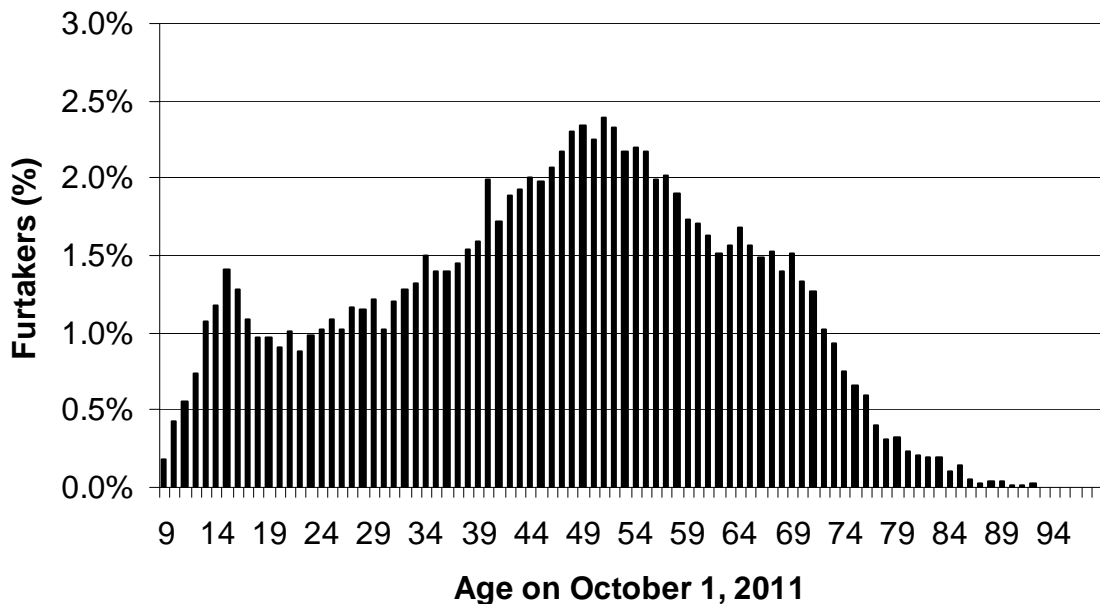


Figure 3. Ages of people that purchased a license to hunt or trap furbearers in Michigan for the 2011 hunting and trapping seasons ( $\bar{x}$  = 46 years).

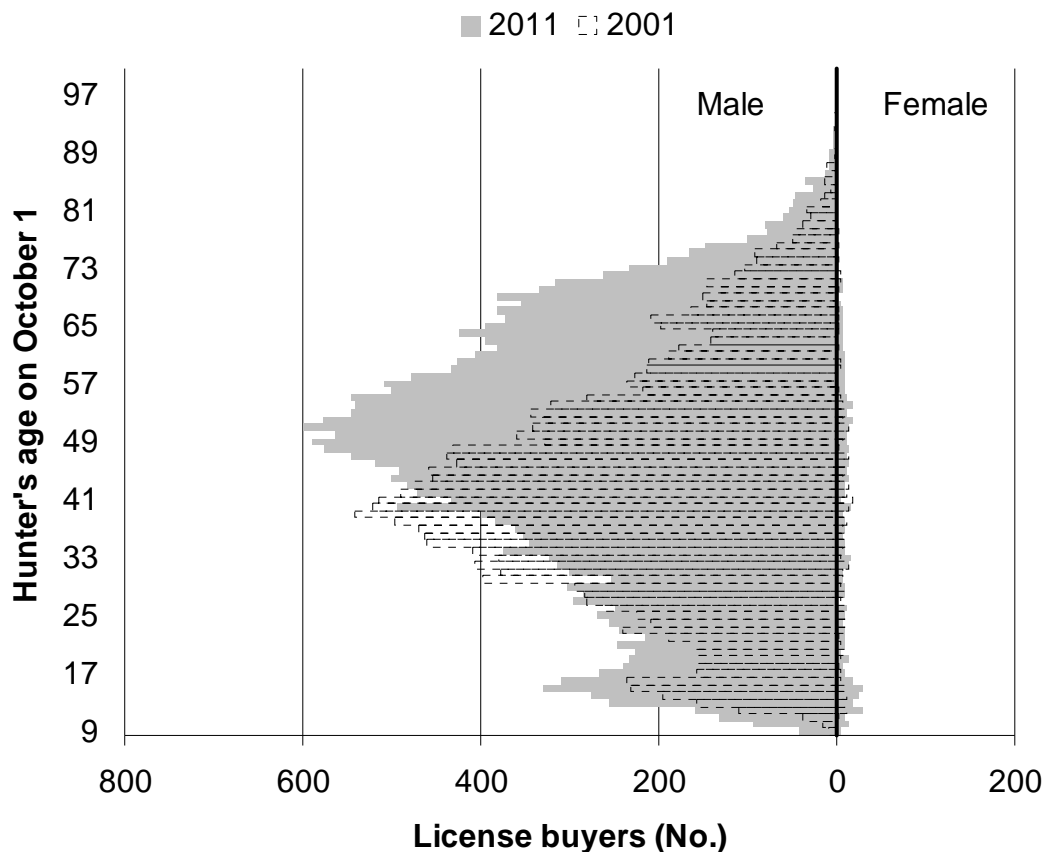


Figure 4. Number of fur harvesters license buyers in Michigan by age and sex during 2001 and 2011 hunting seasons. The number of people buying a license was 19,082 in 2001 and 25,675 in 2011.

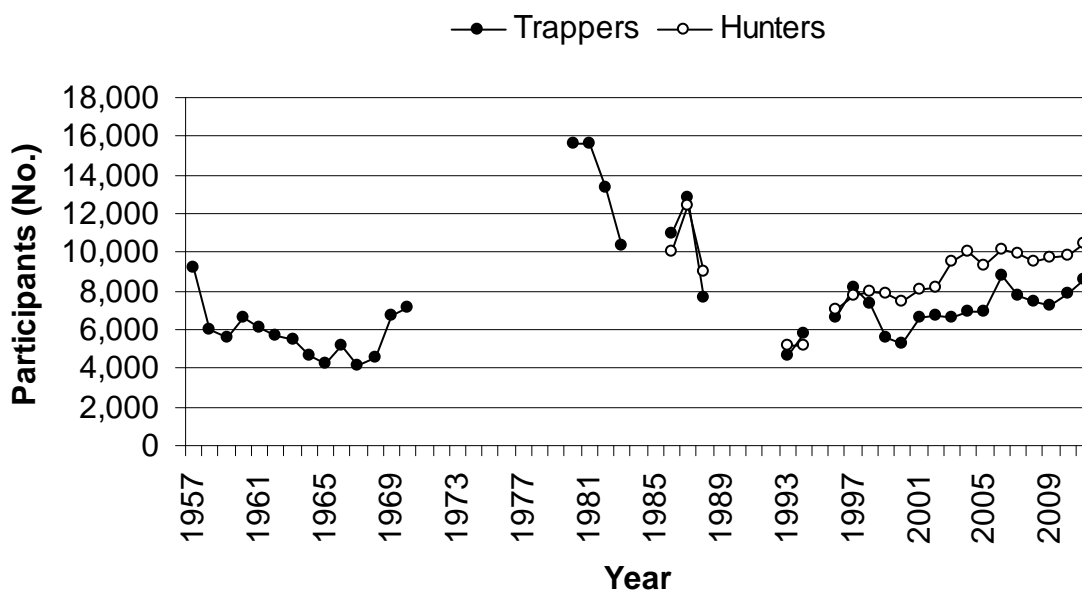


Figure 5. Estimated number of furtakers (trappers and hunters) in Michigan, 1957-2011. Estimates included only license buyers that actually trapped or hunted furbearers (any species). Data were not available for all years.

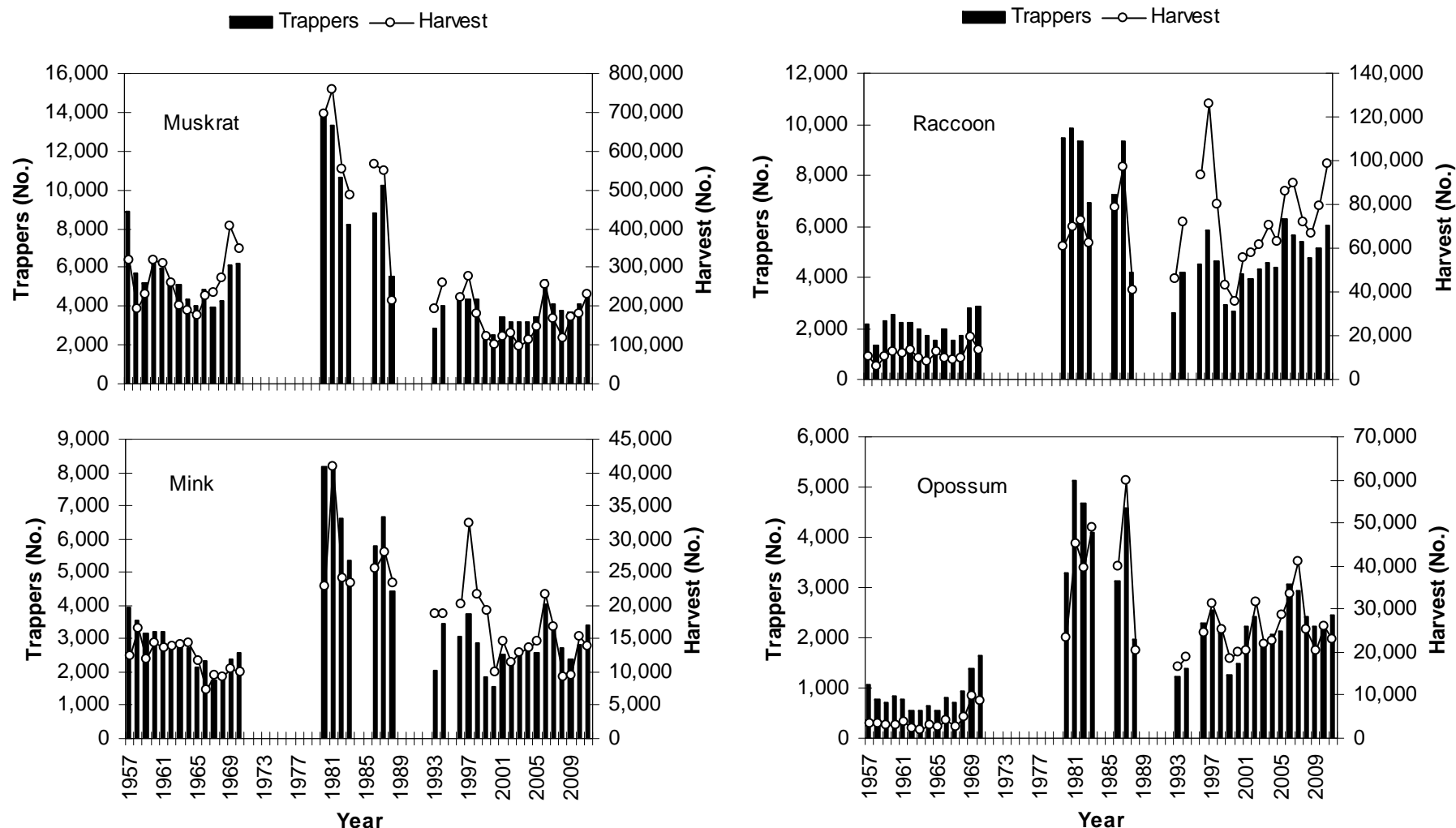


Figure 6. Estimated furbearer harvest by trappers and the number of trappers in Michigan estimated from mail harvest surveys, 1957-2011. Mail survey questionnaires were sent to a random sample of Trapping license buyers during 1957-1969. The sample also included Sportsman's license buyers in 1970-1972. During 1980-1983, the sample included Trapping and Senior Hunting license buyers. During 1986-2011, the sample was selected from people buying either Resident Fur Harvester, Senior Fur Harvester, Junior Fur Harvester, Military Fur Harvester, or Nonresident Fur Harvester licenses. The sample also included Senior Hunting license buyers during 1986-1988. Starting in 1996, samples also included people buying Resident Fur Harvester (trap only) and Junior Fur Harvester (trap only) licenses. Data were not available for all years.

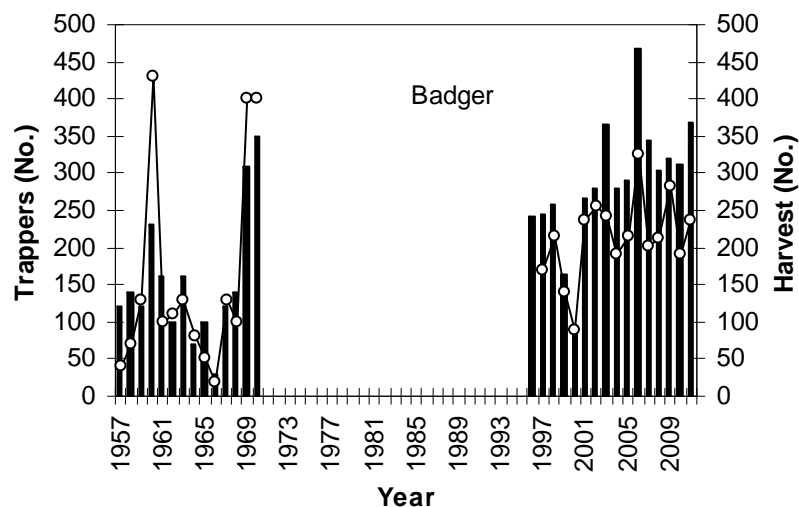
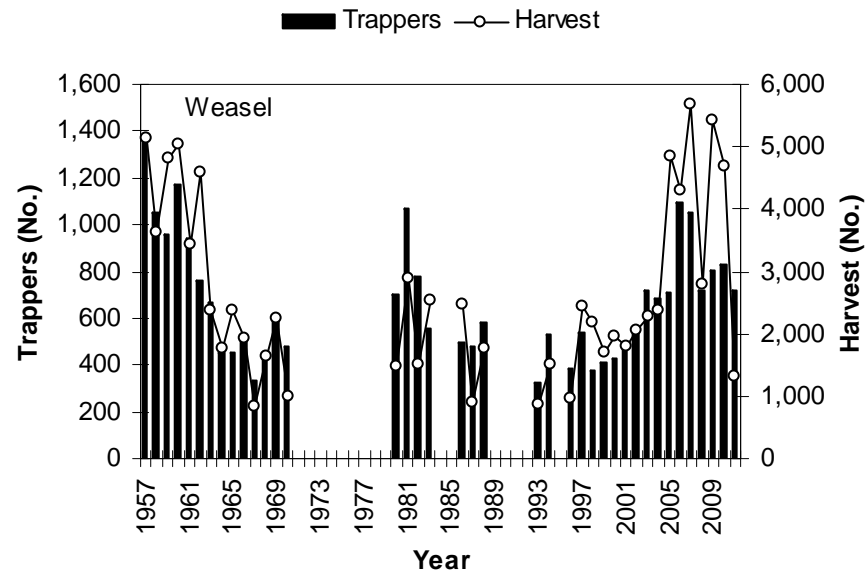
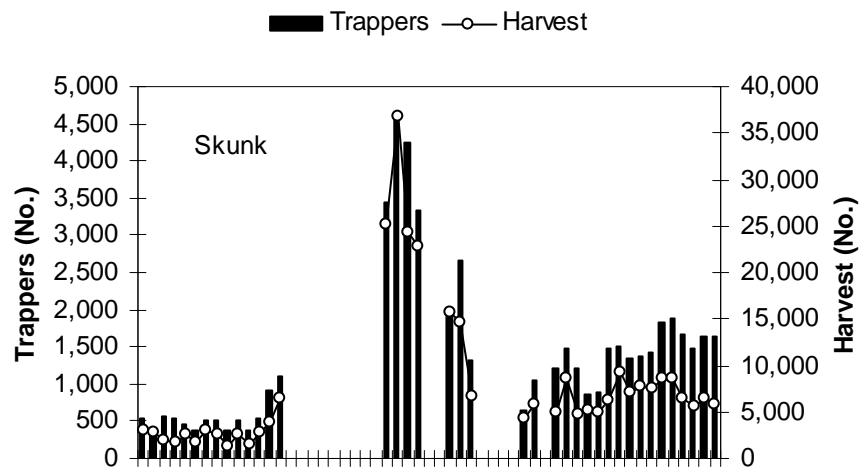


Figure 6 (Continued). Estimated furbearer harvest by trappers and the number of trappers in Michigan estimated from mail harvest surveys, 1957-2011. Mail survey questionnaires were sent to a random sample of Trapping license buyers during 1957-1969. The sample also included Sportsman's license buyers in 1970-1972. During 1980-1983, the sample included Trapping and Senior Hunting license buyers. During 1986-2011, the sample was selected from people buying either Resident Fur Harvester, Senior Fur Harvester, Junior Fur Harvester, Military Fur Harvester, or Nonresident Fur Harvester licenses. The sample also included Senior Hunting License buyers during 1986-1988. Starting in 1996, samples also included people buying Resident Fur Harvester (trap only) and Junior Fur Harvester (trap only) licenses. Data were not available for all years.

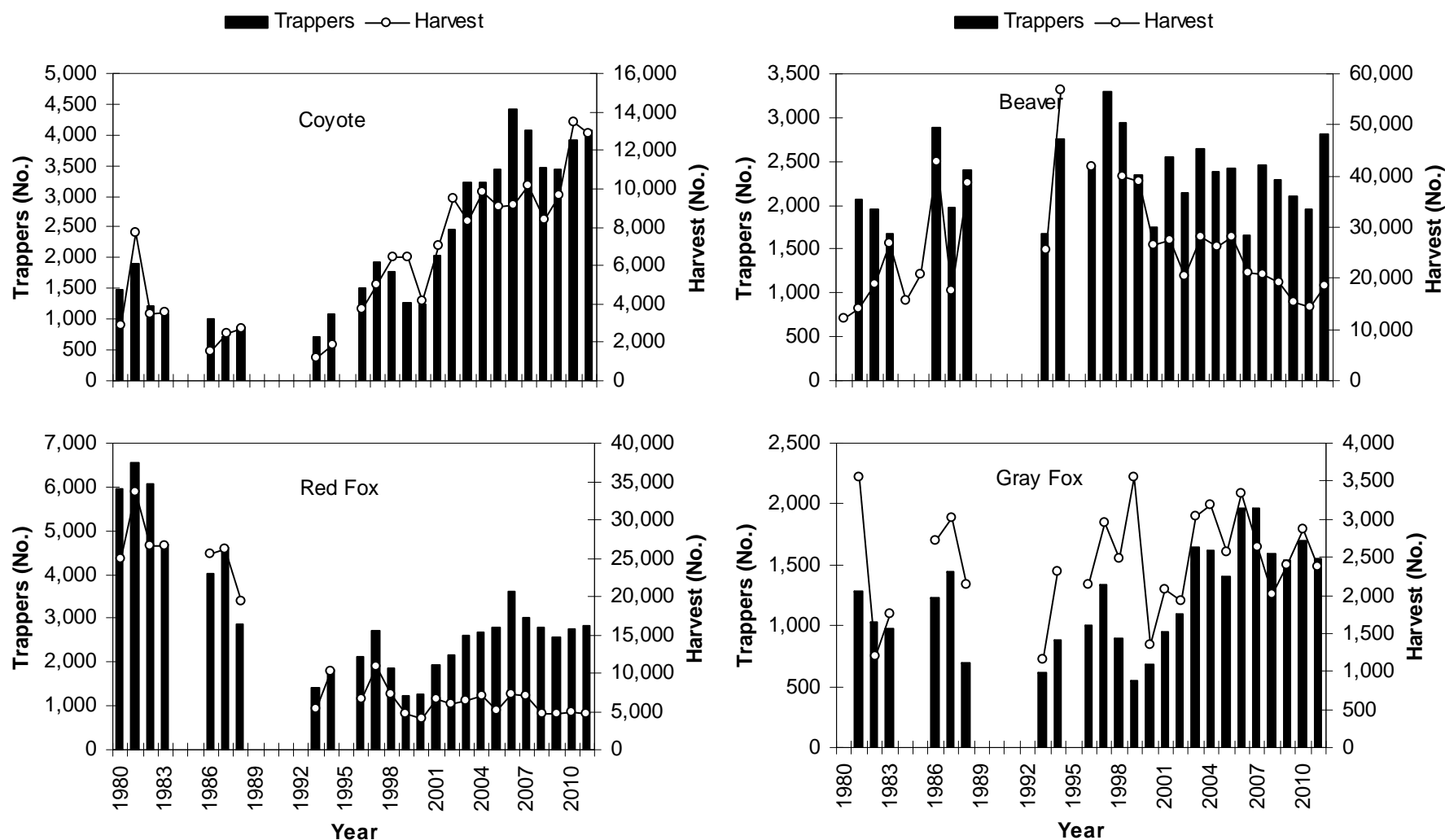


Figure 7. Estimated furbearer harvest by trappers and the number of trappers in Michigan estimated from mail harvest surveys, 1980-2011. The mail survey was sent to a random sample of Trapping and Senior Hunting license buyers during 1980-1983. During 1986-2011, the sample was selected from people buying either Resident Fur Harvester, Senior Fur Harvester, Junior Fur Harvester, Military Fur Harvester, or Nonresident Fur Harvester licenses. The sample also included Senior Hunting license buyers during 1986-1988. Starting in 1996, samples also included people buying Resident Fur Harvester (trap only) and Junior Fur Harvester (trap only) licenses. Data were not available for all years.

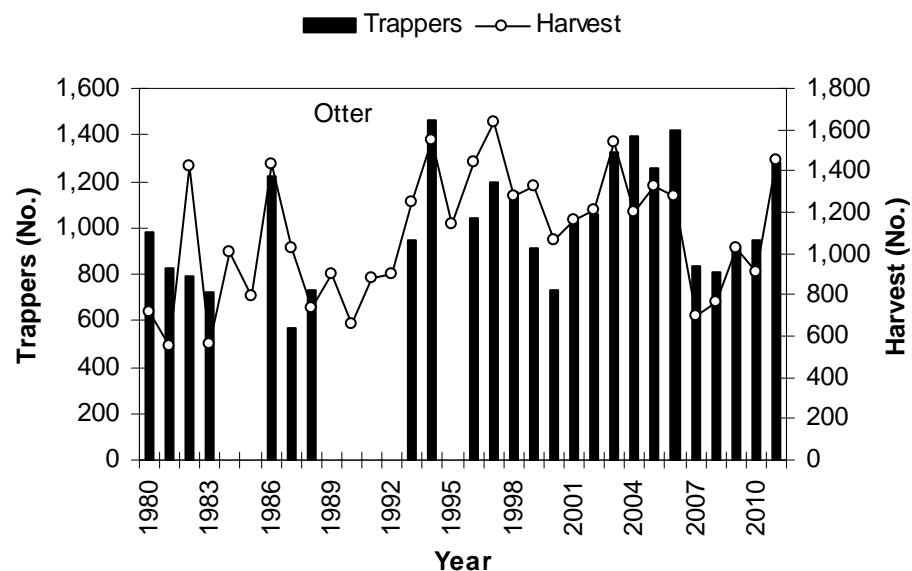
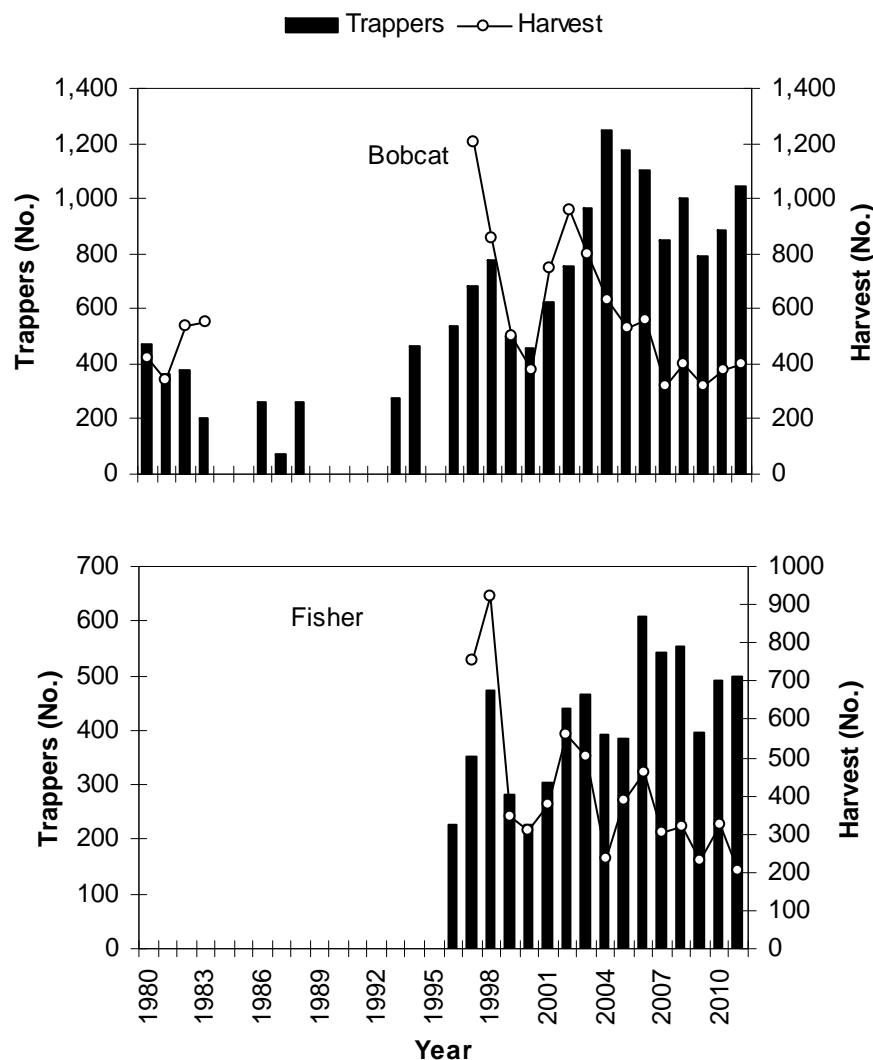


Figure 7 (Continued). Estimated furbearer harvest by trappers and the number of trappers in Michigan estimated from mail harvest surveys, 1980-2011. The mail survey was sent to a random sample of Trapping and Senior Hunting license buyers during 1980-1983. During 1986-2010, the sample was selected from people buying either Resident Fur Harvester, Senior Fur Harvester, Junior Fur Harvester, Military Fur Harvester, or Nonresident Fur Harvester licenses. The sample also included Senior Hunting license buyers during 1986-1988. Starting in 1996, samples also included people buying Resident Fur Harvester (trap only) and Junior Fur Harvester (trap only) licenses. Data were not available for all years.

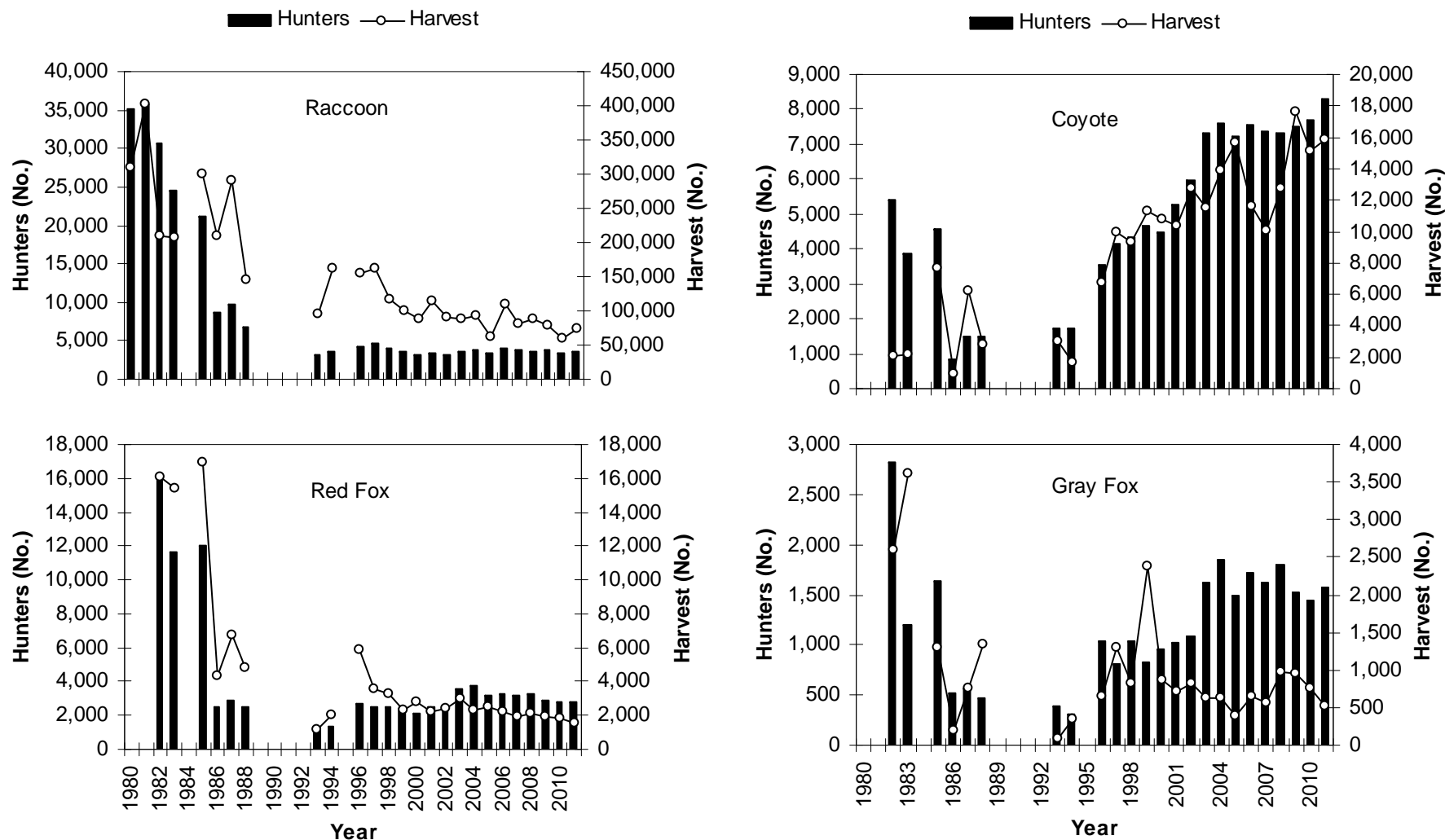


Figure 8. Estimated furbearer harvest by hunters and the number of hunters in Michigan estimated from mail harvest surveys, 1980-2010. The mail survey was sent to a random sample of people buying either small game licenses, Senior Hunting licenses, or Sportsman's licenses during 1980-1985. During 1986-2010, the sample was selected from people buying either Resident Fur Harvester, Senior Fur Harvester, Junior Fur Harvester, Military Fur Harvester, or Nonresident Fur Harvester licenses. The sample also included Senior Hunting license buyers during 1986-1988. Starting in 1996, samples also included people buying Resident Fur Harvester (trap only) and Junior Fur Harvester (trap only) licenses. Data were not available for all years.

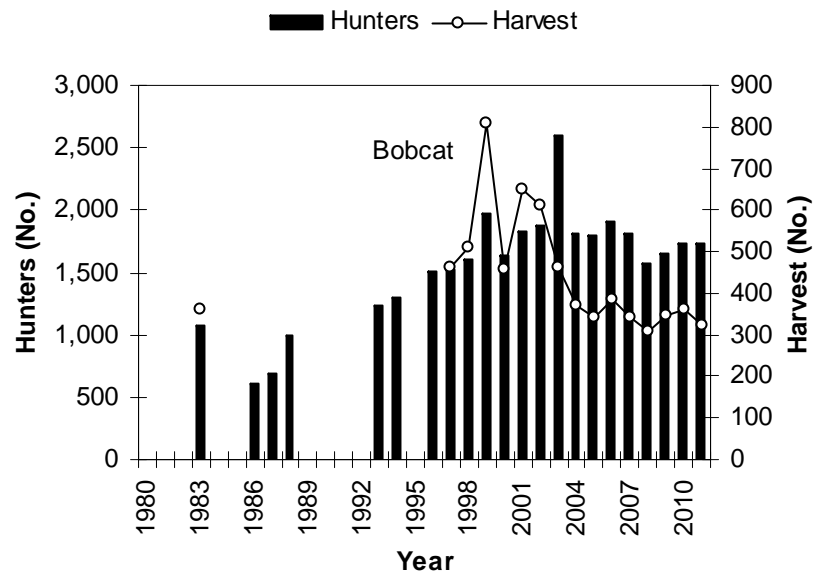


Figure 8 (Continued). Estimated furbearer harvest by hunters and the number of hunters in Michigan estimated from mail harvest surveys, 1980-2011. The mail survey was sent to a random sample of people buying either small game licenses, Senior Hunting licenses, or Sportsman's licenses during 1980-1985. During 1986-2011, the sample was selected from people buying either Resident Fur Harvester, Senior Fur Harvester, Junior Fur Harvester, Military Fur Harvester, or Nonresident Fur Harvester licenses. The sample also included Senior Hunting license buyers during 1986-1988. Starting in 1996, samples also included people buying Resident Fur Harvester (trap only) and Junior Fur Harvester (trap only) licenses. Data were not available for all years.



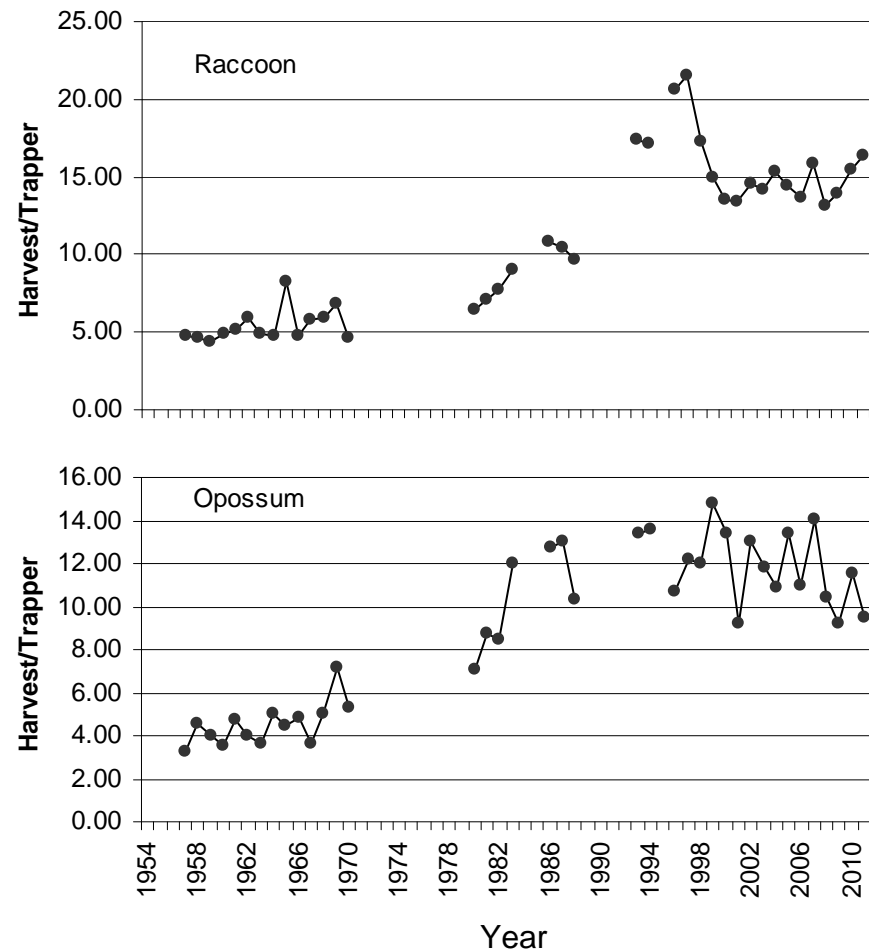
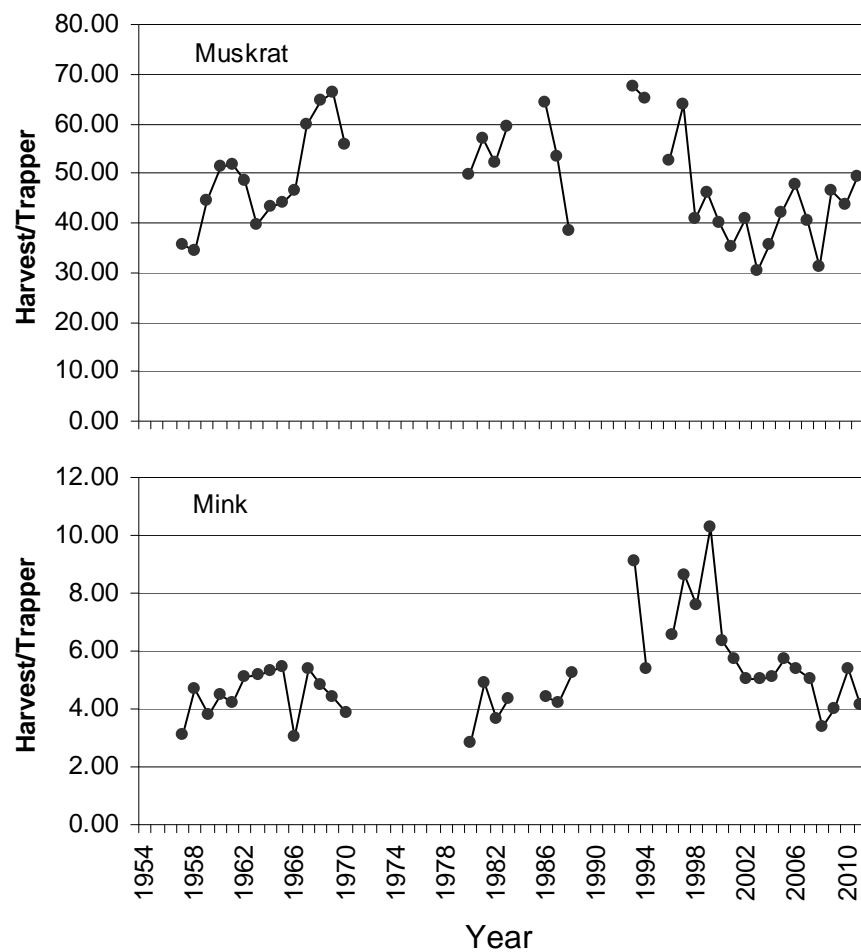


Figure 9. Estimated mean number of furbearers harvested annually by trappers in Michigan estimated from mail harvest surveys, 1954-2011. Data were not available for all years.

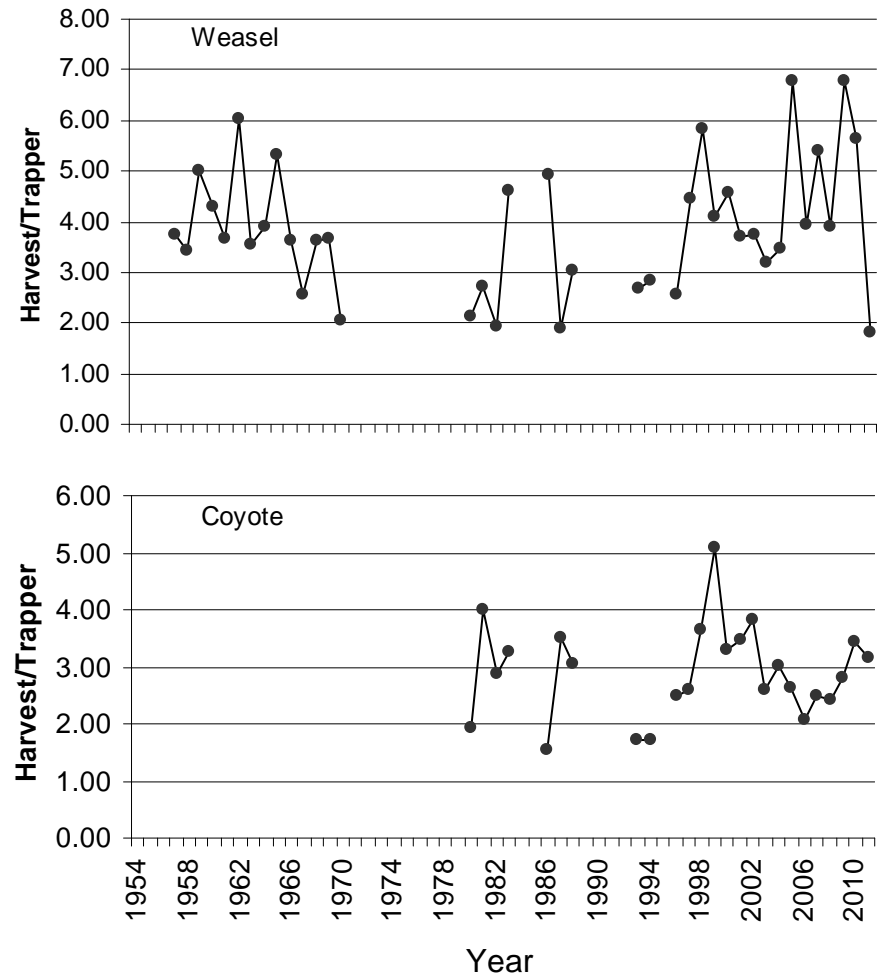
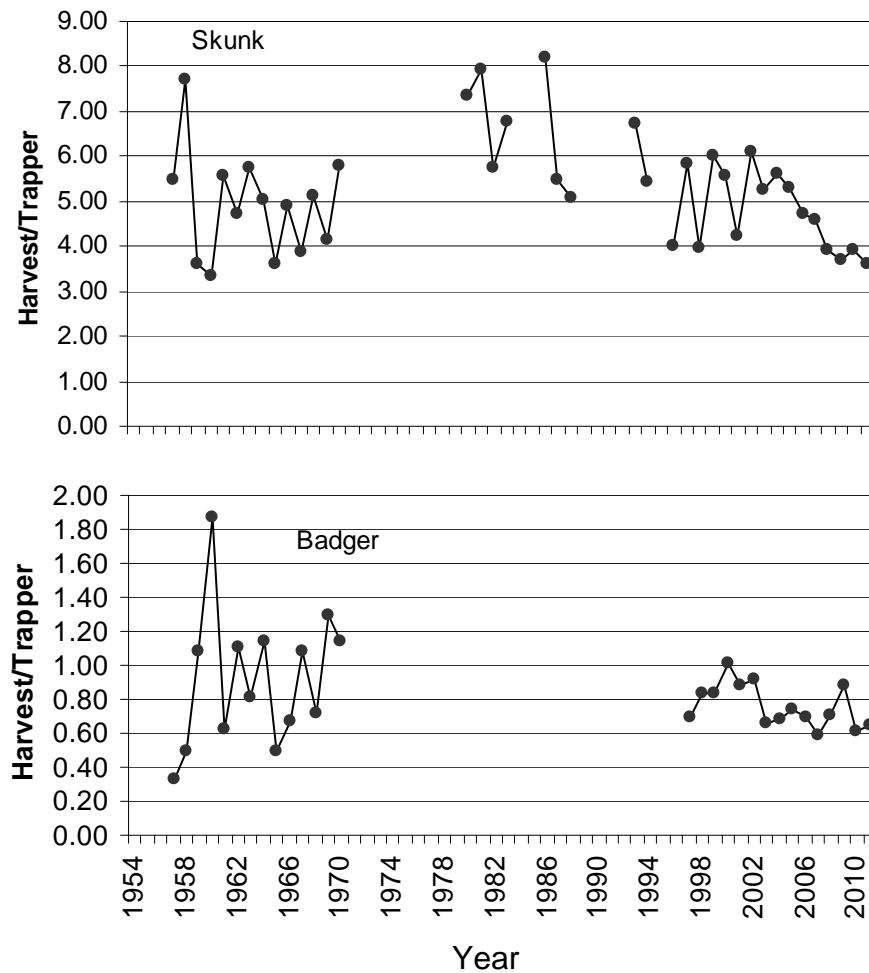


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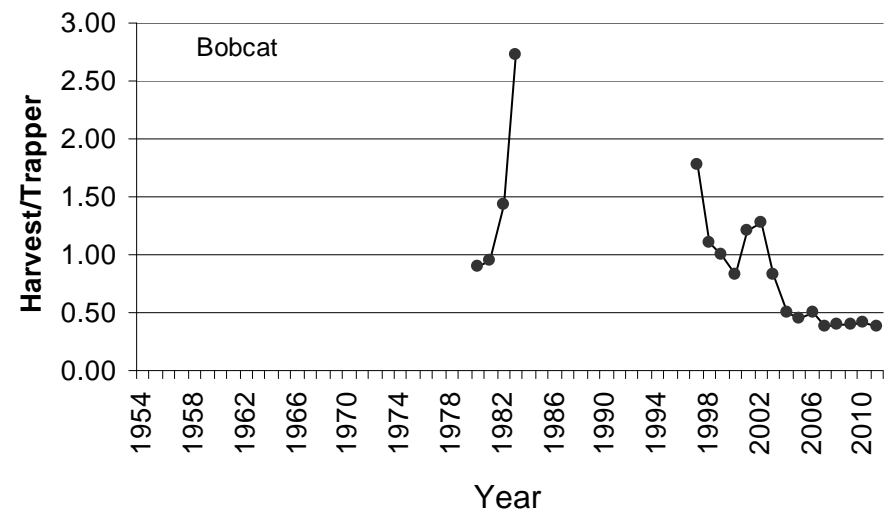
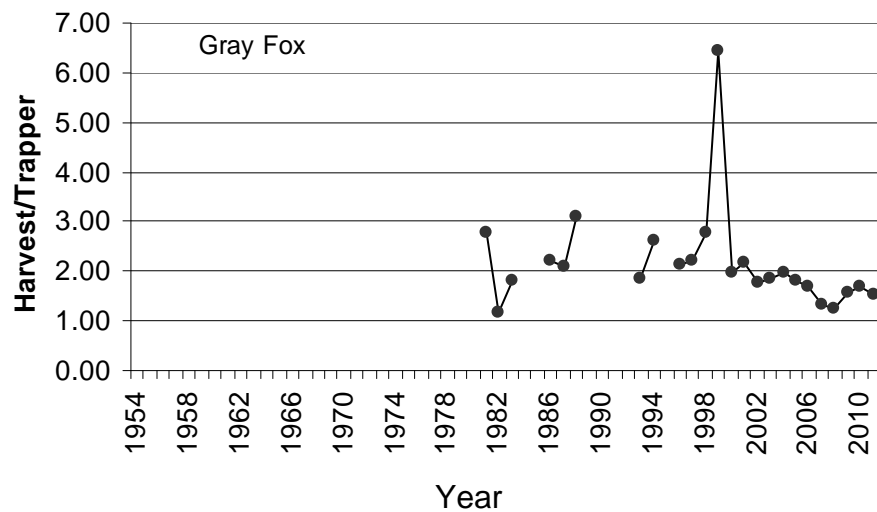
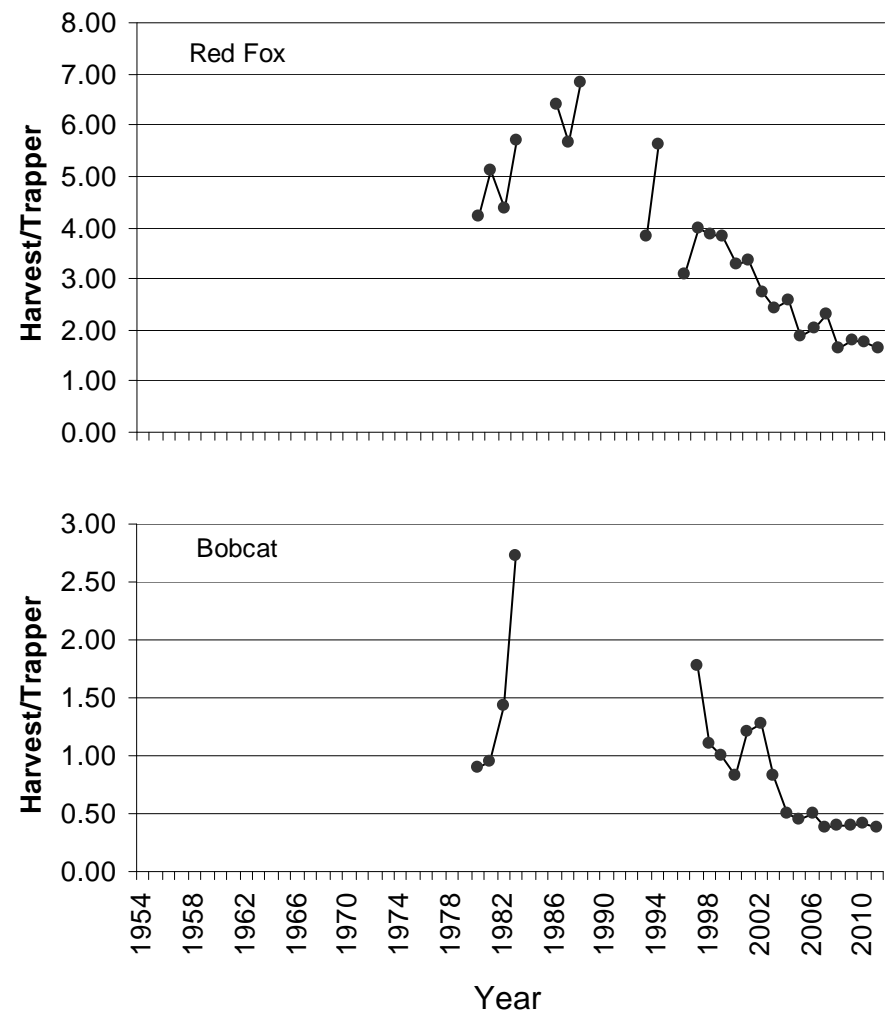
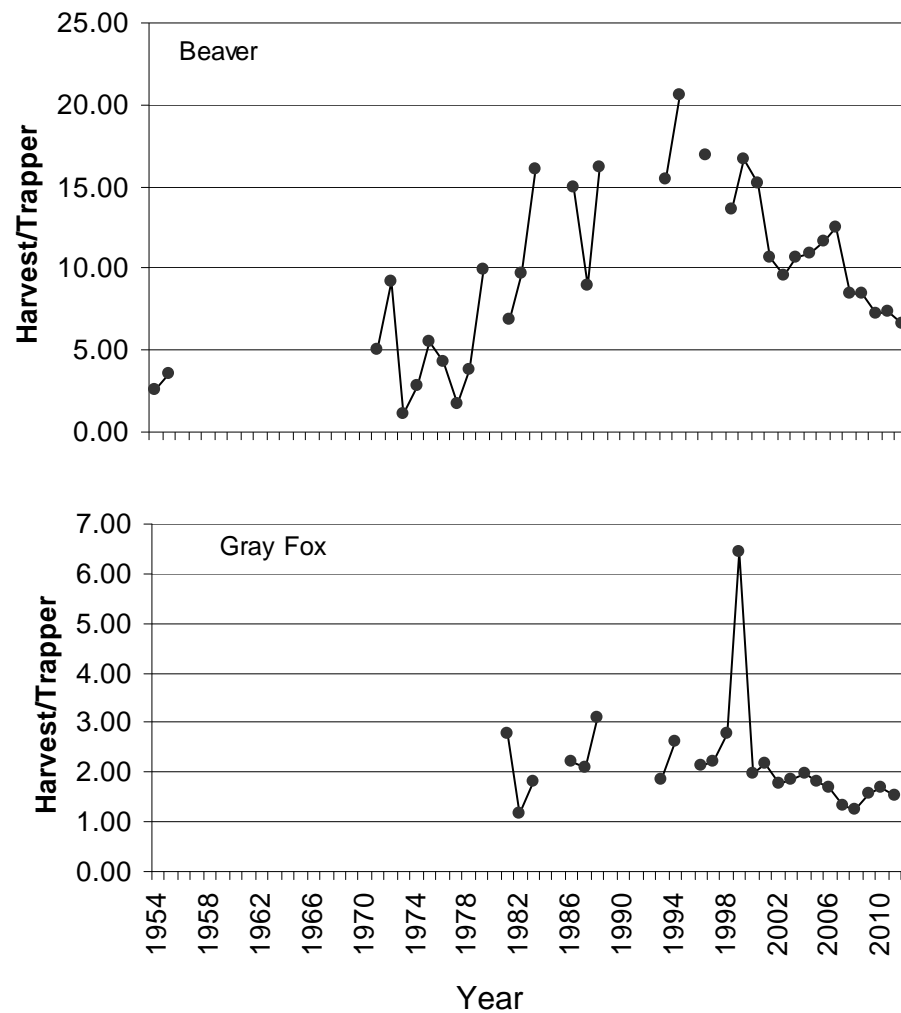


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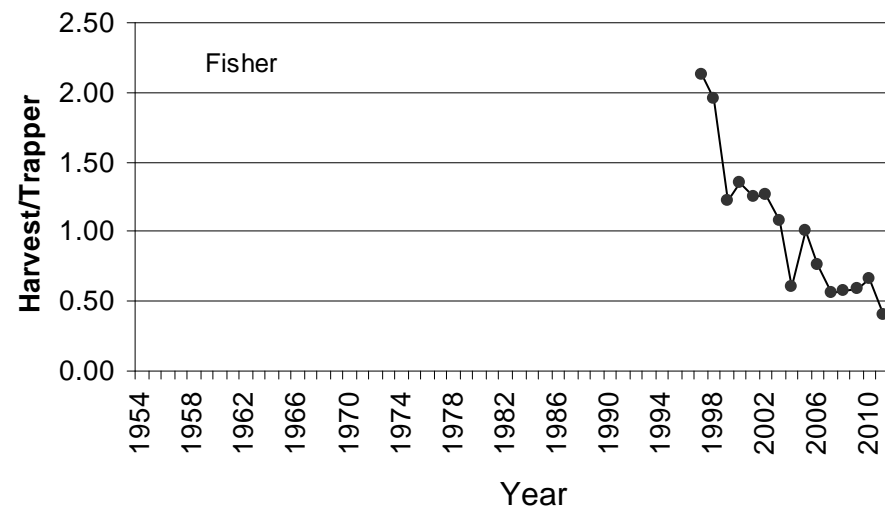
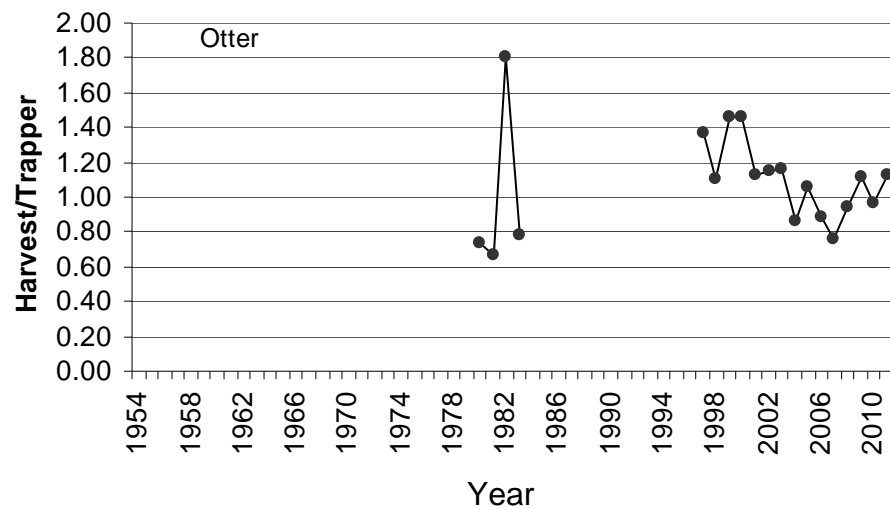


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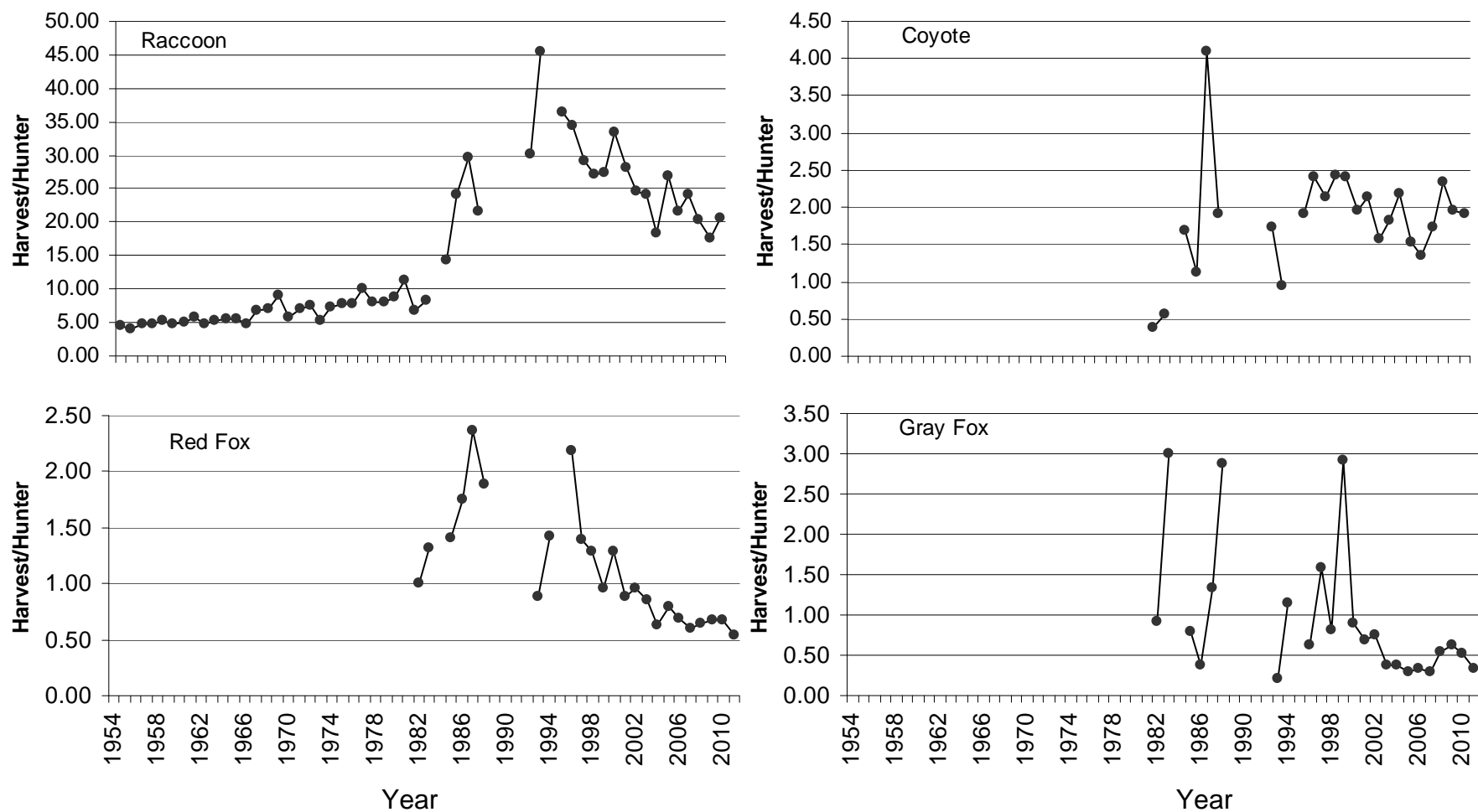


Figure 10. Estimated mean number of furbearers harvested annually by hunters in Michigan estimated from mail harvest surveys, 1954-2011. Data were not available for all years.

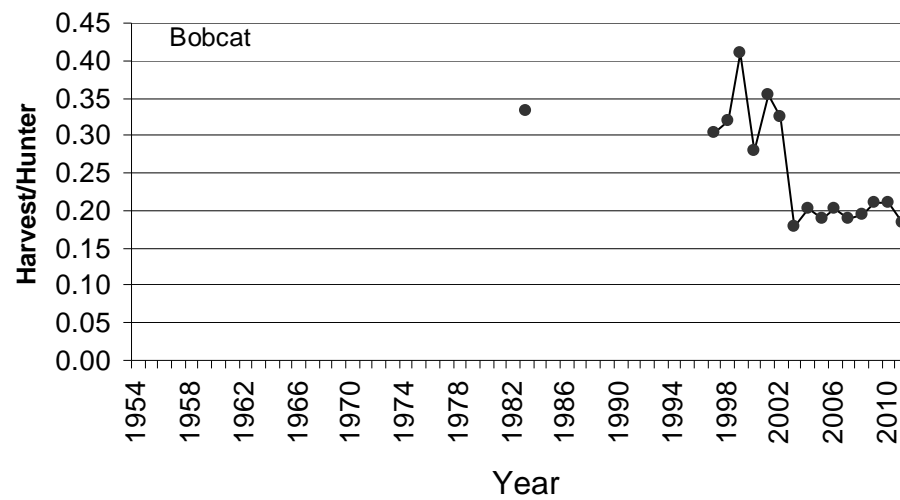


Figure 10 (continued). Estimated mean number of furbearers harvested annually by hunters in Michigan estimated from mail harvest surveys, 1954-2011. Data were not available for all years.

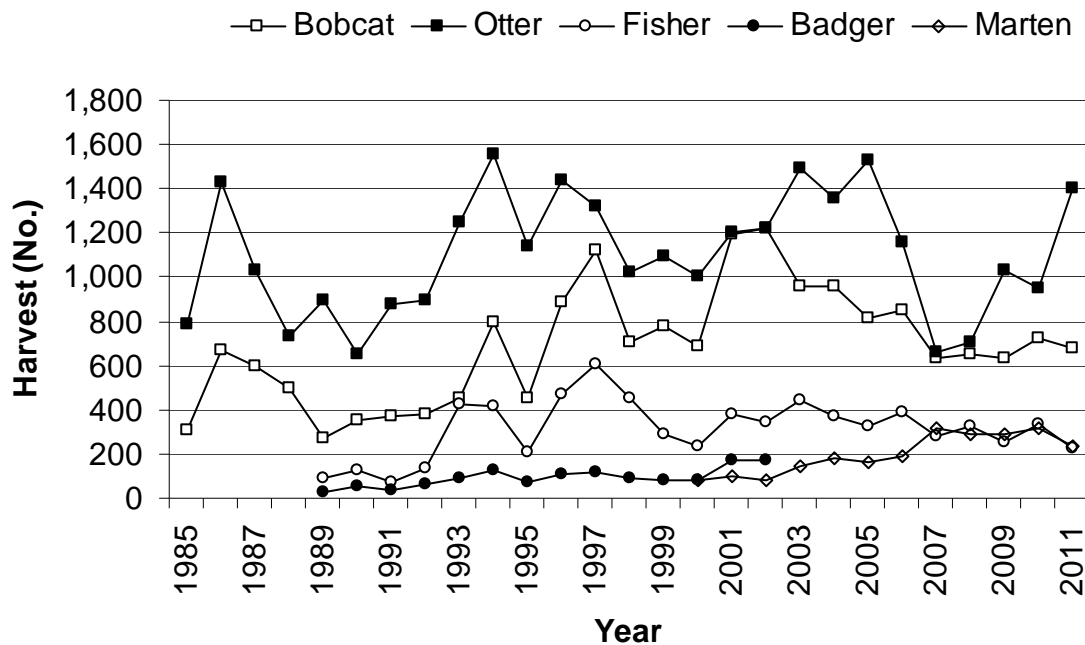


Figure 11. Number of bobcat, otter, fisher, badger, and marten registered by furtakers in Michigan, 1985-2011. Badger and fisher seasons were established in 1989, and marten season started in 2000. Totals for 2011 were preliminary. Beginning in 2003, badger were no longer registered. Registration totals only included animals that were registered and returned to the furtaker.

Table 1. Trapping and hunting seasons when furbearing animals could be harvested in Michigan during 2011 seasons.<sup>a</sup>

Season, species, and area	Season dates
Trapping seasons <sup>b</sup>	
Muskrat and Mink	
UP	October 25 – March 1
NLP	November 1 – March 1
SLP	November 10 – March 1
Raccoon	
UP and NLP	October 15 – January 31
SLP	November 1 – January 31
Fox and Coyote	
Statewide	October 15 – March 1
Bobcat	
UP	December 1 – February 1
NLP	December 10 – 20
Badger	
UP and NLP	October 15 – November 14
SLP	November 1 – March 1
Fisher and Marten	
UP	December 1 – 15
Beaver and Otter <sup>c</sup>	
UP	October 25 – April 15
NLP	November 1 – April 15
SLP	November 10 – March 31
Hunting seasons	
Bobcat	
UP	January 1 – March 1
NLP (northern portion)	January 1 – March 1
NLP (southern portion)	January 1 – February 1
Fox	
Statewide	October 15 – March 1
Raccoon	
Statewide	October 1 – January 31
Coyote	
Statewide	July 15 – April 15

<sup>a</sup>No closed season for opossum, weasel, and skunk.

<sup>b</sup>Nonresidents may trap from November 15 through the regular season closing date, except for beaver. The opening date for nonresident beaver trapping varied by area.

<sup>c</sup>Resident seasons only. Nonresident season occurred during November 15-April 15 (UP), November 24-April 15 (NLP), and December 15 – March 31 (SLP).



Table 2. Number of fur harvester licenses sold and people receiving and returning harvest questionnaire, 2008-2011.

Item	Year			
	2008	2009	2010	2011
Licenses sold	24,338	23,520	24,582	26,034
Individuals buying licenses <sup>a</sup>	24,071	23,251	24,288	25,675
Questionnaires mailed	4,196	4,200	4,200	4,198
Non-deliverable questionnaires	65	57	57	63
Questionnaires returned	2,659	2,670	2,661	2,609
Questionnaires returned (%) <sup>b</sup>	64	64	64	63

<sup>a</sup>A person was counted only once, regardless of how many licenses they purchased. License types included Fur Harvester, Junior Fur Harvester, Senior Fur Harvester, Non-resident Fur Harvester, Military Fur Harvester, Resident Fur (trap only), and Junior Fur (trap only).

<sup>b</sup>Response rate adjusted to exclude non-deliverable questionnaires.

Table 3. Estimated number of fur harvester license buyers who trapped or hunted furbearers in Michigan, 2009-2011.

Activity	2009		2010		2011		Change between 2010 and 2011 (%)
	Estimate	95% CL	Estimate	95% CL	Estimate	95% CL	
Trapped							
Number	7,224	384	7,812	408	8,597	442	10
%	31	2	32	2	33	2	1
Hunted							
Number	9,756	409	9,783	427	10,450	458	7
%	42	2	40	2	41	2	0
Trapped or hunted <sup>a</sup>							
Number	13,369	410	14,106	430	15,226	459	8*
%	57	2	58	2	59	2	1
Trapped only							
Number	3,612	300	4,323	334	4,776	364	10
%	16	1	18	1	19	1	1
Hunted only							
Number	6,145	365	6,294	381	6,629	408	5
%	26	2	26	2	26	2	0
Trapped and hunted							
Number	3,611	301	3,489	306	3,821	333	10
%	16	1	14	1	15	1	1

<sup>a</sup>A person was counted only once, although they may have both trapped and hunted furbearers.

\*Non-overlapping 95% confidence intervals indicated estimates differed significantly between 2010 and 2011 (P<0.005).

Table 4. Estimated number of participants, harvest, and days afield during Michigan furbearer seasons, 2010 and 2011.

Species and season	Participants (No.)				Harvest (No.)				Days afield (No.)			
	Year		95% CL <sup>a</sup>	Change (%)	Year		95% CL <sup>a</sup>	Change (%)	Year		95% CL <sup>a</sup>	Change (%)
	2010	2011			2010	2011			2010	2011		
<b>Trapping</b>												
Mink	2,843	3,382	316	19	15,355	13,975	2,965	-9	73,782	91,427	12,823	24
Raccoon	5,136	6,022	394	17*	79,371	98,422	16,272	24	128,590	161,067	15,863	27*
Opossum	2,242	2,441	271	9	25,781	23,097	5,467	-10	76,627	64,285	10,377	-16
Skunk	1,629	1,645	228	1	6,392	5,904	1,354	-8	45,895	40,816	8,334	-11
Weasel	830	718	156	-13	4,671	1,312	489	-72	21,028	12,571	3,856	-40
Red fox	2,765	2,831	293	2	4,834	4,690	1,073	-3	69,396	76,364	11,173	13
Gray fox	1,699	1,545	222	-9	2,872	2,367	734	-18	45,325	44,472	8,880	0
Coyote	3,909	4,065	342	4	13,464	12,889	4,184	-4	93,493	107,898	13,293	17
Bobcat <sup>b</sup>	887	1,043	46	18*	374	401	38	7	17,822	16,948	1,209	-5
Beaver <sup>c</sup>	1,961	2,812	292	43*	14,304	18,479	3,677	29	40,017	57,453	9,739	44
Muskrat	4,103	4,680	361	14	179,774	231,556	53,605	29	100,043	124,515	14,602	25
Otter <sup>c</sup>	944	1,282	47	36*	914	1,450	81	59*	17,130	25,185	1,775	47*
Fisher <sup>d</sup>	493	500	28	1	327	203	20	-38*	4,942	4,109	302	-17*
Badger	311	367	111	18	191	238	90	24	7,107	6,081	2,624	-14
<b>Hunting</b>												
Raccoon	3,348	3,617	321	8	58,540	74,729	16,638	28	60,979	61,004	8,859	0
Red fox	2,750	2,805	291	2	1,840	1,506	530	-18	35,969	38,801	7,028	8
Gray fox	1,440	1,572	224	9	749	519	302	-31	20,034	21,152	4,965	6
Coyote	7,681	8,304	437	8	15,094	15,876	3,464	5	109,293	113,357	11,504	4
Bobcat <sup>b</sup>	1,734	1,739	53	0	363	320	29	-12	16,591	15,844	900	-4
<b>Trapping and hunting combined</b>												
Raccoon	7,192	8,182	432	14*	137,910	173,151	24,685	26	189,569	222,072	19,195	19
Red fox	4,781	5,032	371	5	6,674	6,196	1,315	-7	105,365	115,164	14,427	11
Gray fox	2,776	2,890	295	4	3,621	2,886	792	-20	65,359	65,624	11,009	2
Coyote	9,636	10,505	459	9	28,558	28,765	6,571	1	202,786	221,254	19,180	10
Bobcat <sup>b</sup>	2,393	2,501	54	5*	737	721	47	-2	34,413	32,792	1,496	-5

<sup>a</sup>95% CL for the 2011 estimate.<sup>b</sup>Bobcat estimates from separate mail harvest survey (Frawley 2011c). See Table 5 for registration totals.<sup>c</sup>Otter estimates from separate mail harvest survey (Frawley 2011b). See Table 5 for registration totals.<sup>d</sup>Fisher estimates from separate mail harvest survey (Frawley 2011a). See Table 5 for registration totals.

\*Non-overlapping 95% confidence intervals indicated estimates differed significantly between 2010 and 2011 (P&lt;0.005).

Table 5. Number of bobcat, otter, fisher, badger and marten registered by furtakers in Michigan, 1985-2011.<sup>a</sup>

Year	Species							
	Bobcat (by method of capture)				Otter	Fisher <sup>a</sup>	Badger <sup>b,c</sup>	Marten <sup>d</sup>
	Hunting	Trapping	Unknown	Total				
1985	193	100	14	307	791			
1986	268	390	11	669	1,431			
1987	315	277	5	597	1,030			
1988	327	170	0	497	731			
1989	178	91	0	269	900	94	28	
1990	266	85	0	351	654	125	52	
1991	292	79	0	371	877	68	35	
1992	276	104	0	380	896	139	63	
1993	285	163	0	448	1,252	425	90	
1994	373	422	0	795	1,552	417	124	
1995	311	137	1	450	1,143	210	75	
1996	463	420	0	883	1,438	471	109	
1997	347	771	0	1,118	1,324	609	117	
1998	331	375	0	706	1,026	455	91	
1999	434	343	0	777	1,097	291	82	
2000	379	307	0	686	1,006	236	85	85
2001	465	727	0	1,192	1,204	381	174	97
2002	482	741	0	1,223	1,221	348	173	85
2003	340	621	0	961	1,496	442		149
2004	321	637	0	958	1,358	368		184
2005	309	508	0	817	1,526	322		164
2006	336	515	0	851	1,154	390		192
2007	336	299	0	632	663	280		316
2008	284	364	0	648	707	326		290
2009	339	291	0	630	1,030	255		285
2010	374	359	0	727	953	337		316
2011 <sup>e</sup>	297	379	0	676	1,398	230		239

<sup>a</sup>Registration totals included only animals legally harvested by furtakers during hunting and trapping seasons.

Also, totals only included animals that were registered and returned to the furtaker.

<sup>b</sup>Badger and fisher seasons were established in 1989.

<sup>c</sup>Furtakers no longer were required to register badgers beginning in 2003.

<sup>d</sup>Marten season was established in 2000.

<sup>e</sup>Preliminary totals.

Table 6. Estimated number of trappers using foothold traps and cable restraints (snares) to catch coyote and fox, trapping effort, mean number of traps set per day, number of animals captured, and number of animals escaping from traps in Michigan during 2011 season.<sup>a</sup>

Type of trapper	Trappers		Trapping effort (day)		Traps set per day		Animals caught		Animals that escaped	
	No.	95% CL	No.	95% CL	Mean	95% CL	No.	95% CL	No.	95% CL
Using foothold traps to catch coyote	3,463	320	82,373	10,457	8.4	0.9	9,809	3,772	2,694	679
Using foothold traps to catch fox	2,426	273	59,979	9,263	9.0	1.0	5,821	1,477	979	422
Using cable restraints to catch coyote	1,075	188	28,183	6,257	8.6*	1.6	2,352	1,252	1,116	419
Using cable restraints to catch fox	559	136	15,422	4,878	8.6	1.9	406	244	274	168

\*Non-overlapping 95% confidence intervals indicated estimates declined significantly between 2010 and 2011 ( $P < 0.005$ ).

Table 7. Estimated number of trappers that caught an incidental bobcat and number of incidental bobcats caught and registered in Michigan, 2011.

Region <sup>a</sup>	Trappers		Incidental bobcats captured and released alive <sup>b</sup>		Incidental bobcats captured and registered <sup>b</sup>	
	No.	95% CL	No.	95% CL	No.	95% CL
Upper Peninsula	101	59	42	56	11	20
Northern Lower Peninsula	100	59	252	191	0	0
Southern Lower Peninsula	48	40	48	40	0	0
Unknown	10	19	10	19	0	0
Statewide	249	92	352	204	11	20

<sup>a</sup>See Figure 1 for region boundaries.

<sup>b</sup>Incidental bobcats caught in Alger, Calhoun, Delta, Grand Traverse, Kalkaska, Lake, Mason, Mecosta, Menominee, Midland, Missaukee, Muskegon, Oceana, Ontonagon, Osceola, and Presque Isle counties.

Table 8. Estimated number of beaver trappers, beaver harvested, and trapping effort (days afield), summarized by trappers with and without an otter harvest tag in Michigan, 2011.

Beaver trapper group	Trappers		Days afield		Harvest	
	No.	95% CL	No.	95% CL	No.	95% CL
Without an otter harvest tag	1,452	217	27,394	6,963	6,765	1,797
With an otter harvest tag	1,360	210	11,714	3,248	11,714	3,248
Combined	2,812	292	57,453	9,739	18,479	3,677